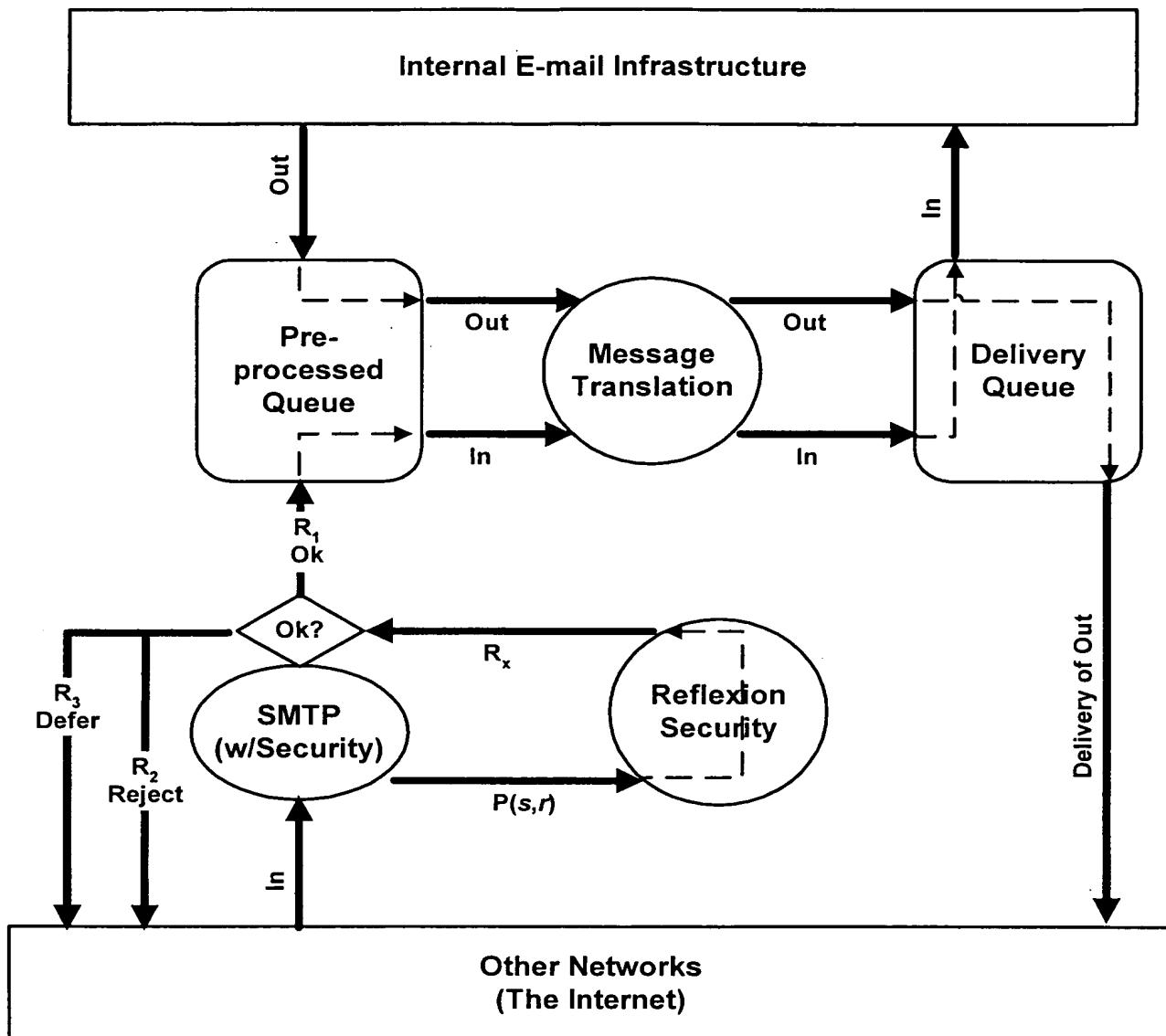
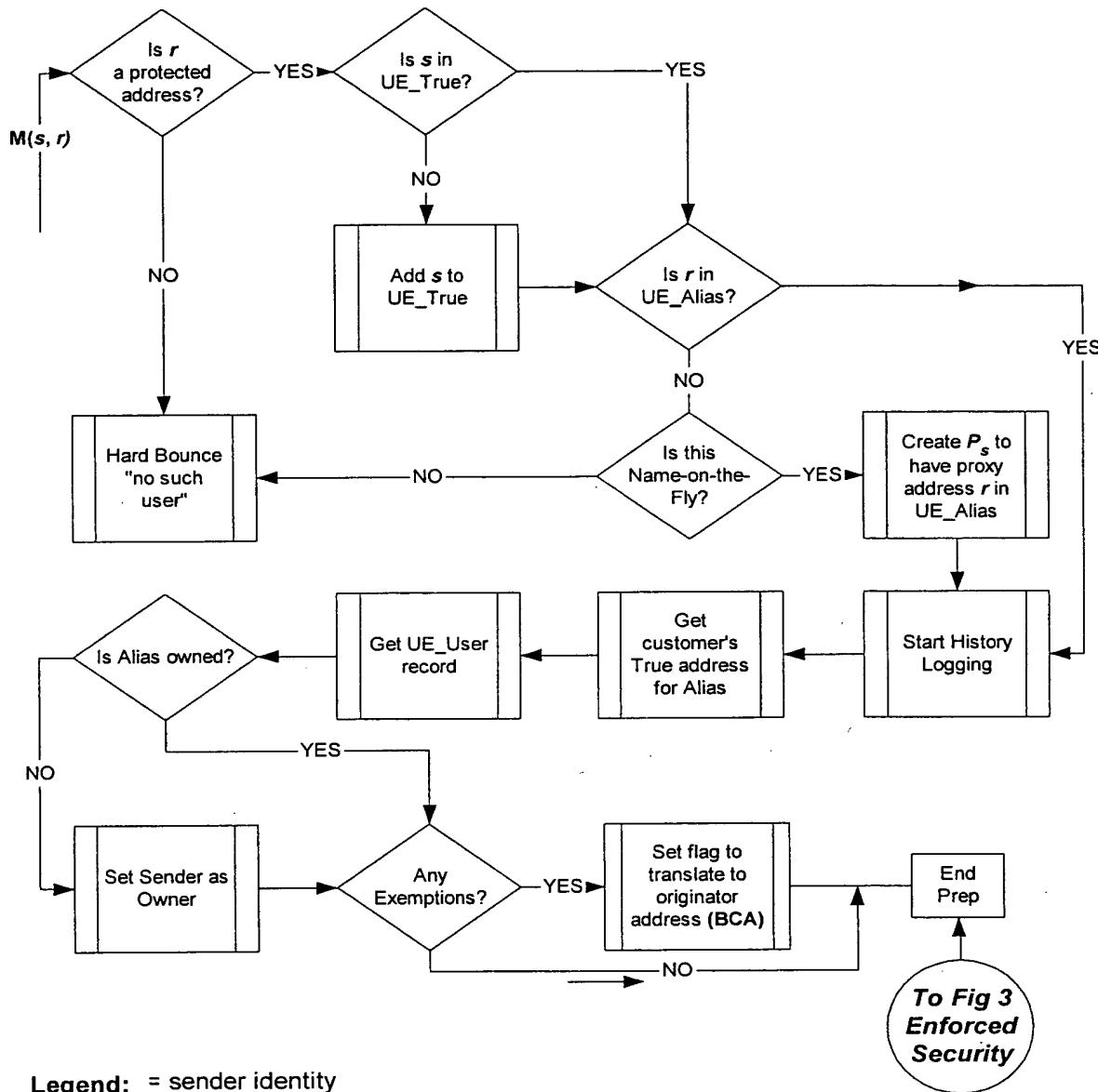


**Fig. 1 Architecture**

**Legend:**

- $s$  = sender identity
- $r$  = recipient identity
- $P(s,r)$  = Request security status on a message from  $s$  to  $r$
- $R_x$  = Security status on a message from  $s$  to  $r$
- $R_1$  = Ok, continue processing message
- $R_2$  = Reject, do not process the message
- $R_3$  = Defer, temporarily defer the message back to the sending server

**Fig. 2 Inbound Message Preparation**

**Legend:**  $s$  = sender identity

$r$  = recipient identity

$M(s,r)$  = A message from  $s$  to  $r$

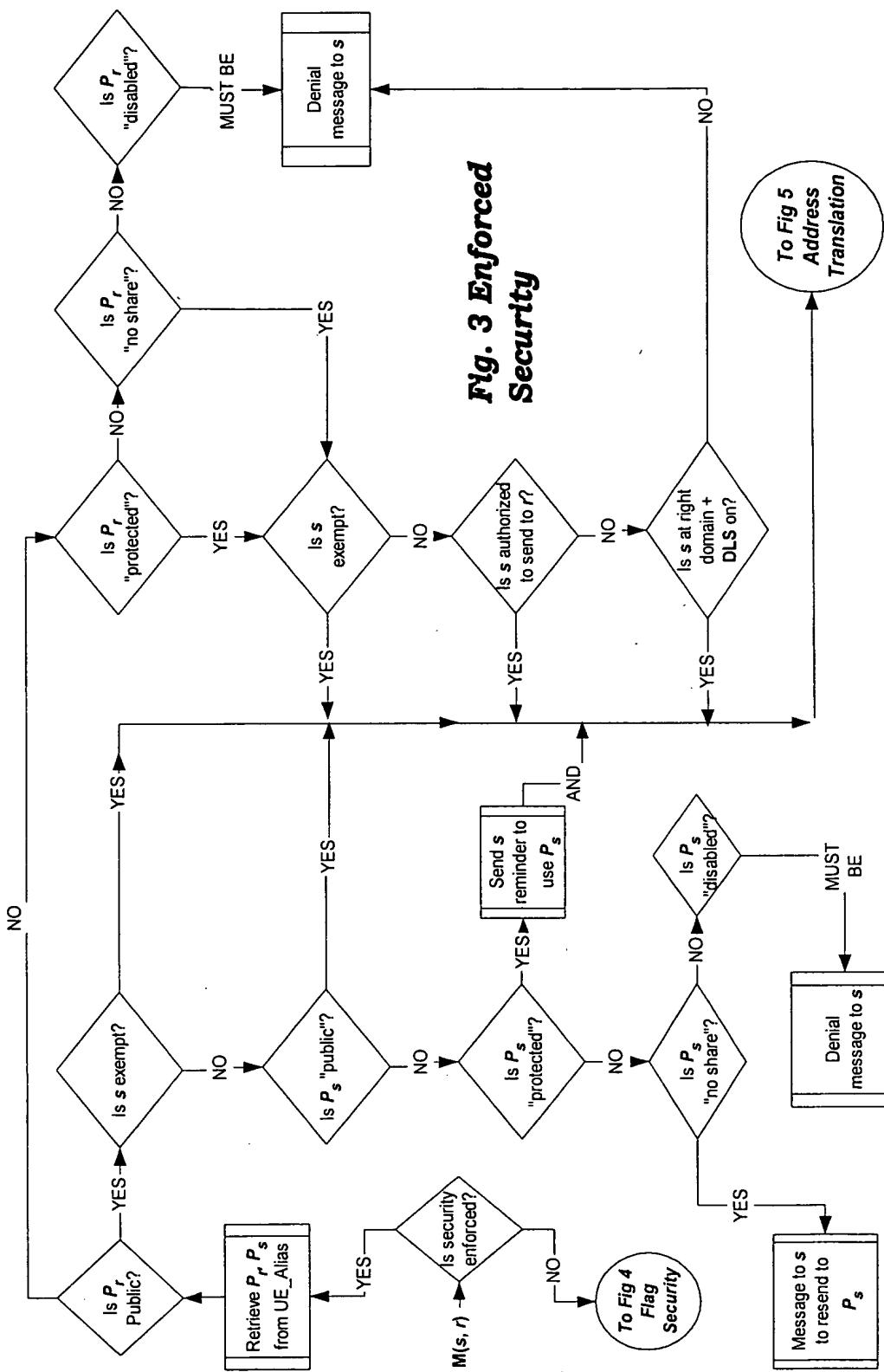
$UE\_TRUE$  is a database table containing "real" (i.e. non-proxy) addresses

$UE\_ALIAS$  is a database table containing proxy addresses

$UE\_User$  is a database table containing user information

BCA = "Business Card Address", the originator address managed by the internal mail transport agent (i. e. mail server)

$P_s$  is the security settings for the proxy address registered to  $s$  for user that owns originator address to which proxy  $r$  is a substitute



**Legend:**  $s$  = sender identity  
 $r$  = recipient identity

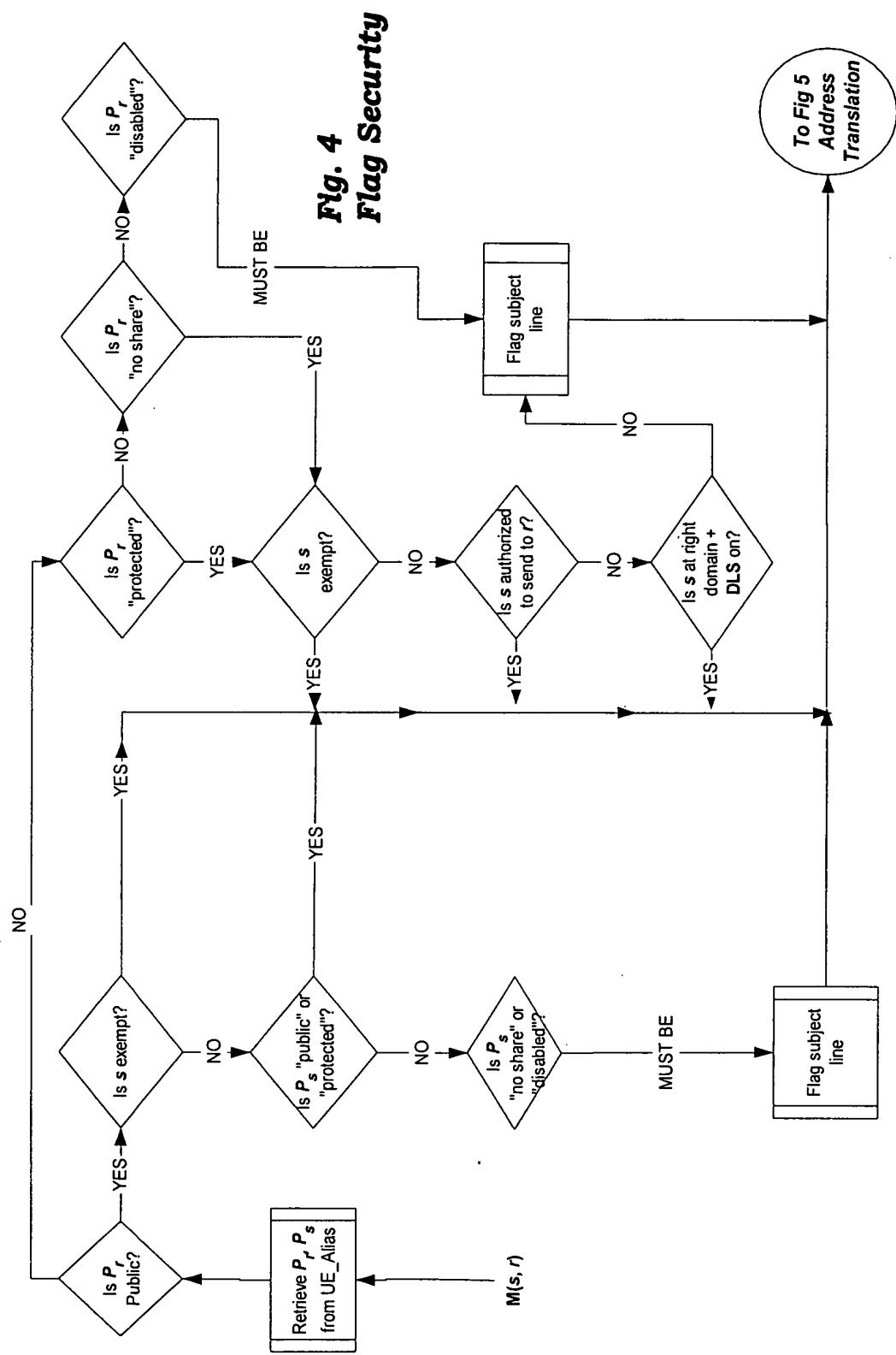
DI-S stands for Domain Level Sharing

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Note: It is possible for  $P_s$  to be the same object as  $P_r$ .

$P_r$  is the security settings for the proxy address  $r$

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- Legend:
- $s$  = sender identity
  - $r$  = recipient identity
  - $P_s$  is the security settings for the proxy address registered to  $s$  for user that owns proxy  $r$
  - $P_r$  is the security settings for the proxy address  $r$
- $M(s,r)$  = A message from  $s$  to  $r$
- UE\_Alias is a database table containing proxy addresses
- DLS stands for Domain Level Sharing
- Note: It is possible for  $P_s$  to be the same object as  $P_r$

**Fig. 5 Address Translations****"True" Identifiers (UE\_True table)**

$T_1$  = Inside Identifier 1  
 $T_2$  = Outside Identifier 1  
 $T_3$  = Outside Identifier 2  
 $T_4$  = Inside Identifier 2  
 $T_n$  = Outside Identifier  $n$

 $s$  = sender identity $r$  = recipient identity $a$  = An address reference to translate $M(s,r)$  = A message from  $s$  to  $r$ **Proxy Identifiers (UE\_Alias table)**

$P_{(T_2,T_1)}$  = Substitute identifier for  $T_1$ , registered to  $T_2$   
 $P_{(T_3,T_1)}$  = Substitute identifier for  $T_1$ , registered to  $T_3$   
 $P_{(T_n,T_1)}$  = Substitute identifier for  $T_1$ , registered to  $T_n$   
 $P_{(T_x,T_x)}$  =  $T_x$ , registered to  $T_x$

 $T(a)$  = Method that returns translation of address  $a$  for a message from  $s$  to  $r$  $D_{(T_x,T_1)}$  = Method that returns the proxy  $P$  that  $T_x$  uses to send e-mail to  $T_1$ .Sometimes  $D_{(T_x,T_1)} \leftrightarrow P_{(T_x,T_1)}$ **INBOUND, successfully past security, where:**

1.  $a = r, s = T_2, r = P_{(T_2,T_1)}$ , then  $T(a) = T_1$
2.  $a = r, s = T_2, r = P_{(T_3,T_1)}$ , then  $T(a) = T_1$
3.  $a = P_{(T_4,T_4)}, s = T_2, r = P_{(T_2,T_1)}$ , then  $T(a) = T_4$
4.  $a = P_{(T_4,T_4)}, s = T_2, r = P_{(T_3,T_1)}$ , then  $T(a) = T_4$
5.  $a = T_3, s = T_2, r = P_{(T_x,T_1)}$ , then  $T(a) = T_3$
6.  $a = P_{(T_x,T_y)}, s = T_2, T_2$  is exempt,  $r = \text{any } P$ , then  $T(a) = T_y$

**OUTBOUND, no security on outbound, where:**

7.  $a = r, s = T_1, r = T_2$ , then  $T(a) = P_{(T_2,T_1)}$
8.  $a = r, s = T_1, r = T_2, D_{(T_2,T_1)} \leftrightarrow P_{(T_2,T_1)}$ , then  $T(a) = D_{(T_2,T_1)}$
9.  $a = r, s = T_1, r = T_2, D_{(T_2,T_1)} = P_{(T_2,T_1)}$ , then  $T(a) = P_{(T_2,T_1)}$
10.  $a = r, s = T_1, r = T_2$ ,  $r$  is exempt, then  $T(a) = P_{(T_1,T_1)} [s]$
11.  $a = T_3, s = T_1, r = T_2$ , then  $T(a) = P_{(T_3,T_1)}$
12.  $a = T_3, s = T_1, r = T_2, D_{(T_3,T_1)} \leftrightarrow P_{(T_3,T_1)}$ , then  $T(a) = D_{(T_3,T_1)}$
13.  $a = T_3, s = T_1, r = T_2, D_{(T_1,T_2)} = P_{(T_2,T_1)}$ , then  $T(a) = P_{(T_3,T_1)}$
14.  $a = T_3, s = T_1, r = T_2, T_3$  is exempt, then  $T(a) = P_{(T_1,T_1)} [s]$

E-mail address:

Password:

Remember me on this computer.

**Log In**

[Forgot Your Password?](#)

[Create New Account](#)

FIG. 7 Login Page

View: Active | All

Per-Page:

Contacts 1 - 4 of 4

**Contacts**

Edit	Name	Address	Last	Security	In	Out	Code	Used	Reflected
<input type="checkbox"/>	Sonya Aronin	sonya@rxtxtech.com	07-31-03 14:02:45	Protected				20	
<input type="checkbox"/>	Unnamed	sonya.flying@rxtxcmd.com	08-06-03 12:13:08	Public	0	1	j631	0	0
<input type="checkbox"/>	Unnamed	sonya@tyr.cs.brandeis.edu	12-20-08	Public	6	0	nov	0	3
<input type="checkbox"/>	Dmitri Shvartsman	dmitri.shvartsman@axcelis.com	11-29-11	No sharing	3	1	n04	3	2
<input type="checkbox"/>	Brandeis Mail	sonya@brandeis.edu	07-31-03 14:02:45	Public	18	6	b74	0	8
<b>Totals for this page:</b>					27	8		3	13
<b>User Totals:</b>					27	8		3	13

FIG. 8 Contacts List

**Contact Details**

Unnamed <sonya@tyr.cs.brandeis.edu>

**Name:** [Sonya Aronin] **Address:** sonya@tyr.cs.brandeis.edu

**sonya.nov@rxtxtech.com** 11-26-04  
 Name-on-the-fly (sonya.nov.new@rxtxtech.com)

**Security Status**

Public  
 Protected  
 No sharing  
 Disabled

**Exemptions**

Single address exempted from Reflexion  
 The domain tyr.cs.brandeis.edu exempted from Reflexion

**Message Activity**

12-20-07 Inbound to own unique, Subj: Advanced Footer  
12-19-09 Inbound to own unique, Subj: Standard Footer  
11-29-10 To this No Share address, used by sonya@tyr.cs.brandeis.edu

[View all history](#)

**Save** **Reset**

FIG. 9 Contact Details Page



| Contacts | Options | History | Reflected | Logout  
| Password | Reports | Options

### Options

#### User Properties

Your Name: Sonya Aronin

E-mail Address: [sonya@rxttech.com](mailto:sonya@rxttech.com) [View properties]

Prefix: sonya

#### Reflexion Properties

Mode:  Enforce  Flag  Pass through  Reverse

Keep copies of reflected messages  
 Append security codes to addresses  
 Auto exempt on reply to flagged msgs

Message Footer:  Standard  Advanced  No footer

FIG. 10 Reflexion User Options Page



Administrator

| New User | Exempts | History | Reports | Logout  
| Users

### Global Exemptions

#### Exempt a Domain or Address

Enter a valid e-mail address: [ ]

Exempt the address  Unexempt the address

Exempt the entire domain  Unexempt the entire domain [View Examples]

FIG. 11 Administrator Add a Global Exemption Page

Reflexion

| New User | Exempts | History | Reports | Logout

### New User

Enter the Name and Business Card Address (BCA) of the New User.

Name:

Business Card Address:  @ rfxtech.com

Enter Additional Addresses that are linked to the BCA, such as old addresses that are still used.

Additional Address 1:  @ rfxtech.com

Additional Address 2:  @ rfxtech.com

Additional Address 3:  @ rfxtech.com

User Type:  Domain Group Administrator  Normal User

FIG. 12 Administrator Create New User Page